

# **Animal welfare benefits to mobile slaughter of cattle**

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The European legislation allows for national initiatives that investigate animal-friendly alternatives of live transport to the slaughter-house, such as mobile slaughter units. We reviewed the main welfare benefits in the literature with a focus on cattle. The main benefit consists of decreased transport time and elimination of transport-associated stressors such as loading and unloading, shocks and sensory stimuli of driving, injuries, fatigue, waiting time, deprivation of water, and inadequate micro-climate. Another benefit consists of the more familiar environment at slaughter on the farm allowing for reduction of stressors caused by unfamiliarity but only if the potential stressors such as people, odors, noises, light and drafts, isolation stress, regrouping stress and rough handling are reduced. Equipment and floors should be designed to reduce the risks of contracting bruises and fractures. Without transport and in case of good practice handling prior to killing, a more welfare-friendly slaughter can be realized. The Eurobarometer shows an increasing demand for products from welfare-friendly production systems. Focus group meetings with cattle breeders revealed a positive attitude towards mobile slaughter. Perceived potential benefits include low-stress, respectful, relaxed, familiar, quiet context for the animal, maximal transparency from birth till death, respectful death, reduced stress to the farmer himself, attractive marketing story fitting well with a short-circuit and family farming strategy, potential for on-farm education on slaughter. Perceived hindrances include the present uncertainty about national legal aspects and food safety regulations, practical organization with regard to timing and location, post mortem meat processing and conservation, waste treatment, profitability of the endeavor. The unit design and practices should be carefully monitored to guarantee maximal animal welfare. For all animals, mobile slaughter, in best practice circumstances, reduces risk factors that could impair welfare of slaughter animals.

## **Introduction**

Mobile slaughter units can be a more welfare-friendly alternative of live transport to the slaughter-house. The European Council Regulation (EC) No 1099/2009 on the protection of animals at the time of killing states “Mobile slaughterhouses reduce the need for animals to be transported over long distances and therefore may contribute to safeguarding animal welfare. (...) it is appropriate to allow Member States to establish or maintain national rules regarding mobile slaughterhouses.” Also, the Eurobarometer (2015) shows an increasing demand for products from welfare-friendly production systems. We reviewed the main welfare benefits in the literature relating to mobile slaughter i.e. the reduction of transport and manipulation in a more familiar environment.

## **Welfare problems during transport**

The FAO considers transport to be the most stressing and welfare-compromising phase in the chain of activities between farm and slaughter (FAO, 2001). During loading and unloading there is a high injury risk (Pulido et al., 2018) and bruising risk increases significantly after 30 minutes delay of unloading (Goldhawk et al. (2015) A rough driving style will result in a

significant increase in bruises and wounds (EFSA 2011) and emotional and physical stress will be caused by excessive vibrations (Van de Water et al., (2003). At each moment of transport, independent of transport duration, a higher heart rate and cortisol value is observed (Burdick et al., 2010; Marahrens et al., 2003). Independent of age and sex, stress increases with increasing transport time (Ponnampalam et al., 2017). Cortisol values increase progressively with transport time (Chulayo et al. 2016) Waiting time on the truck due to traffic or administration is frequent (González et al., 2012b). Stress by transport reduces immune function making animals more susceptible to respiratory diseases (Greger, 2007). Transport results in higher excretion of gut pathogens (Barham et al., 2002) (Dewell et al., 2008).

The microclimate during transport causes the most important welfare problems (Ponnampalam et al., 2017), especially during hot summer months (Grandin & Gallo, 2008). Without mechanical climate control, this is hard to control due to the effect of wind speed, wind direction in relation to driving direction, driving speed, number of animals, excretions, transpiration, bedding and type of walls (Dalla Villa et al., 2009; Norton et al., 2013; Bryan, 2013). Excessive heat leads to heat stress and lowered welfare (Gaughan et al., 1999), tissue damage (Chulayo et al., 2016), mortality (Cauldfield et al., 2014) and decreased immune response (Carroll et al., 2012).

Weight loss due to stress during transport is common, linked to stress and reduced water and food intake (Cernicchiaro et al., 2012). Weight loss increases with increasing temperature and rough treatment (Coffey et al. (2001)), increased waiting time (Grandin (2000) and less experience of the driver González et al. (2012b).

Temperament, breed (Zavy et al., 1992) and individual differences (Bourguet et al., 2010) influence the stress response during transport. Younger and lighter animals show more respiratory problems following transport, and males show a higher risk of illness and mortality after transport than females (Cernicchiaro et al., 2012; Bach et al., 2004). Reactive breeds react more to separation of the herd, have higher cortisol values and are more agitated during handling, during transport and during restraint (Bourguet et al., 2015).

### **Welfare problems due to handling**

Apart from reduction of transport, mobile slaughter offers the potential benefit of manipulation in a more familiar environment. If well managed, this allows for reduction of stressors caused by novelty and unfamiliarity. Breeds with a wild temperament and extensively kept grazers show a higher stress response, more agitated behaviour (Voisinet et al. (1997) and higher cortisol levels (Francisco et al., 2015) in unfamiliar settings. Extensively kept cattle (Burdick et al., 2010; Fisher et al., 2009; Petherick et al., 2009) and beef breeds (Cullinane et al., 2010) are handled less often than intensively kept cattle or dairy cattle and are therefore less habituated to human procedures and manipulations. Stress levels in bovines will be influenced by the temperament of the animals, the quality of the infrastructure and the behaviour of the caretakers (Petherick et al., 2009; Grandin, 2006; Coombes et al. , 2014).

Regrouping with strange individuals results in more fights (Burdick et al., 2010;) in young bulls and more mounting behaviour (Broom, 2003). The risk of bruising is related to mixing unknown individuals, to inadequate handling, high numbers of animals and bad equipment and facility design (Marahrens et al., 2011). Especially bulls show a higher risk of bruising (Hultgren et al., 2014). Higher frequencies of stress behaviour (Costa et al., 2006), prolonged waiting times in the slaughterhouse (Romero et al., 2013), rough treatment by handlers prior to slaughter (Grandin, 1996), increases the incidence of bruising. Strict control is needed to limit waiting times, regrouping stress, crowding, isolation stress or rough treatment.

### **Cattle breeders perception of mobile slaughter**

In 2018, we organized focus group-meetings with Flemish cattle breeders (n=3; n=4; n=6). They expressed a positive attitude towards mobile slaughter. Perceived potential benefits included low-stress, respectful, relaxed, familiar, quiet context for the animal, maximal transparency from birth till death, respectful death, reduced stress to the farmer himself, attractive marketing story fitting well with a short-chain and family farming strategy, potential for on-farm education on slaughter. Perceived hindrances included the present uncertainty about national legal aspects and food safety regulations, practical organization with regard to timing and location, post mortem meat processing and conservation, waste treatment and cost and profitability of the endeavor.

For animals unfit for travel, on-farm slaughter is a practical solution. For all animals, but particularly for wild or extensively kept animals, on farm slaughter without transport can be a welfare-friendly alternative to slaughter after transport. The unit design and practices should be carefully monitored to guarantee maximal animal welfare. Equipment and substrates need to be designed to reduce the risks of injuries. Regular audits and training of handlers are required to safeguard welfare (Hemsworth et al., 2011).

## **Conclusion**

The legislative and practical framework supporting mobile slaughter pilot projects should be developed nationally to stimulate local initiatives. Strengths, weaknesses, opportunities and threats regarding animal welfare should be thoroughly evaluated. Sharing and refining of initiatives and practices will allow to optimize animal welfare.

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